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Pseudoscorpions from Middle Asia, Part 3 (Arachnida: Pseudoscorpiones)

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With 38 figures

Summary

This third contribution to the pseudoscorpion fauna of Middle Asia treats the families Cheiridiidae and Atemnidae (5 species). Besides, additional materials from the families Neobisiidae, Olpiidae and Garypidae are listed. *Diplotemnus egregius* Beier, *Apocheiridium ferum* (Simon) and *A. rossicum* Redikorzev are recorded from Middle Asia for the first time. The following **new synonymies** are proposed: *Apocheiridium nepalense* Ćurčić with *Apocheiridium rossicum* Redikorzev; *Diplotemnus afghanicus* Beier, *D. lindbergi* Beier, *D. ophthalmicus* Redikorzev and *D. persicus* (Redikorzev) with *Diplotemnus insolitus* Chamberlin.

Zusammenfassung

Dieser dritte Beitrag zur Pseudoskorpion-Fauna Mittelasiens behandelt die Familien Cheiridiidae und Atemnidae (5 Arten). Daneben wird zusätzliches Material der Familien Neobisiidae, Olpiidae und Garypidae aufgelistet. *Diplotemnus egregius* Beier, *Apocheiridium ferum* (Simon) und *A. rossicum* Redikorzev werden erstmals aus Mittelasien gemeldet. Die folgenden **neuen Synonyme** werden vorgeschlagen: *Apocheiridium nepalense* Ćurčić mit *Apocheiridium rossicum* Redikorzev; *Diplotemnus afghanicus* Beier, *D. lindbergi* Beier, *D. ophthalmicus* Redikorzev und *D. persicus* (Redikorzev) mit *Diplotemnus insolitus* Chamberlin.

Резюме

Это третья работа по ложноскорпионам Средней Азии, где помимо представителей семейств *Cheiridiidae* и *Atemnidae*, приводятся и новые данные по видам и из других семейсте. Виды *Apocheiridium ferum (Simon), A. rossicum Redikorzev* и *Diplotemnus egregius Beier* впервые указываются для фауны Средней Азии. Новые синонимы: *Apocheiridium nepalense Ćurčić = Apocheiridium rossicum Redikorzev; Diplotemnus afghanicus Beier, D. lindbergi Beier, D. ophthalmicus Redikorzev, D. persicus (Redikorzev) = Diplotemnus insolitus Chamberlin.*

1. Introduction

The present paper is the third contribution to a revision of the Middle Asian pseudoscorpion fauna, being primarily restricted to the families Cheiridiidae and Atemnidae. Besides, we have at our disposal some material of the families Neobisiidae, Olpiidae and Garypidae, which are presented herein as an addendum.

In this paper we try to decide some problems within the genus *Diplotemnus*. In particular both type and non-type materials of *ophthalmicus, persicus* (n. comb.) and *pomerantzevi* have been restudied, and new synonymies have been determined. Besides, the species *insolitus* Chamberlin from the Western Himalayas ought to be considered as the type-species of *Diplotemnus*.

Material

The present paper is based on material which was collected in various parts of Middle Asia (see map fig. 38) in 1985–1991 by Aliev, Dashdamirov, Deryugin, Fedorov, Ibraev, Kalabin, Kandykbaev, Komarova, Ovtchinnikov, Tarabaev, Zonstein, Zorkin and Zyuzin. The samples have been shared between the collections of the Institute of Zoology in Baku (*IZB*), the Staatliches Museum für Naturkunde Stuttgart (*SMNS*), the Biological Institute Novosibirsk (*BIN*) and the Senckenberg Museum Frankfurt/Main (*SMF*). Besides, the Redikorzev collection housed in the Zoological Institute of the Russian Academy of Sciences St. Petersburg (*ZIP*) has been revised by one of us (S. D.). In the text each locality is followed by the respective number put in square brackets and referring to the numbers in the map (fig. 38).

Acknowledgements

We are very grateful to all the persons whose collections we used for the present study, particularly to Dr. V. Ovtcharenko (ZIP) and Dr. D. Logunov (BIN) who provided museum collections, and Dr. M. Harvey (Perth) for his comments and literature. We are also indebted to Dr. Y. Tarbinsky and Mr. S. Zonstein (Bishkek) for the organization of an expedition to Middle Asia for one of us (S. D.) in spring 1990. Dr. S. Golovatch (Moscow) very kindly provided linguistic help.

2. The species

2.1. *Apocheiridium ferum* (Simon 1879) (figs. 1–2)

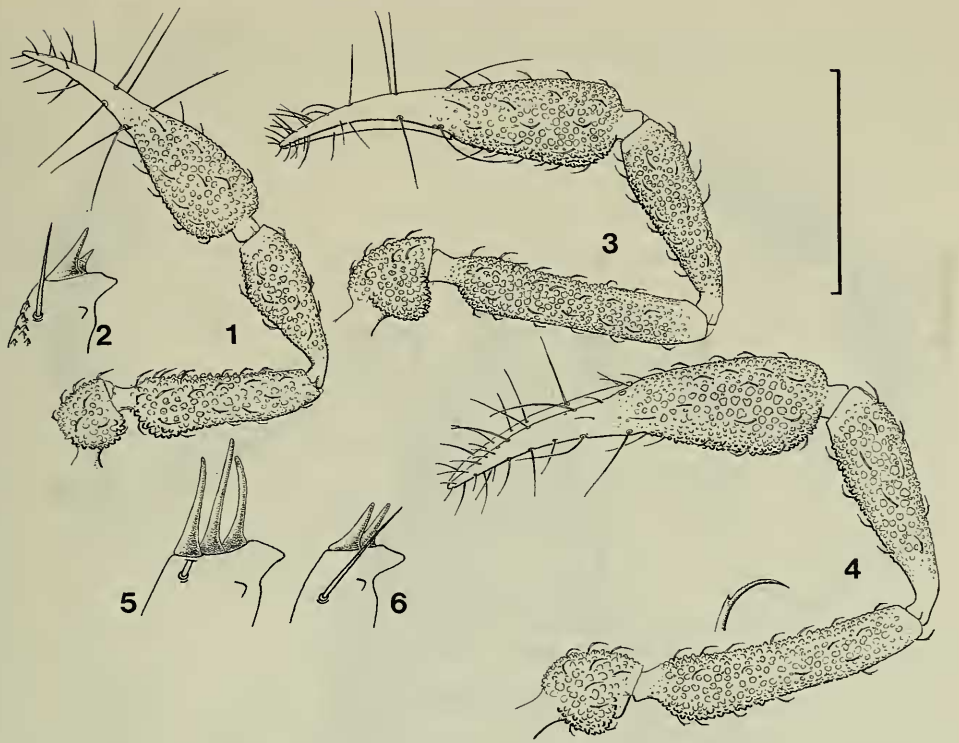
Material: Uzbekistan, Surkhandarya Distr., Babatag Mt. Ridge [6], Kokbel Pass, 1430 m, under bark of *Pistacia vera*, 5. V. 1990 leg. Dashdamirov, 1 ♂ (IZB 230).

Description: Carapace with 4 setae on anterior and 17 setae on posterior margin. Tergal chaetotaxy 20-19-16-18-23-25-26-26-30-21-14. Galea bifid with one terminal and one subterminal branch. Pedipalp femur 3.86x, tibia 2.88x, chela with pedicel 3.8x, without pedicel 3.6x longer than broad. Movable finger with a single trichobothrium.

Measurements (in mm) of pedipalps: femur 0.27/0.07, tibia 0.23/0.08, chela with pedicel 0.38/0.10, length of hand with pedicel 0.19, length of fixed finger 0.19.

Remarks: This species differs from *A. turcicum* Beier 1967 by the size of the pedipalps. Thus *turcicum* has more plump palpal segments (tibia 2.4x, femur 3.2x, chela with pedicel 3.2x longer than broad) as compared to *ferum* (tibia 2.7–3.0x, femur 3.8–4.0x, chela 3.5–3.8x longer than broad). Prior to a complete revision of the Asian species assigned to this genus it is impossible to distinguish *ferum* satisfactorily from other described species.

Distribution: *Apocheiridium ferum* is widely distributed in Europe, this being the first record from Middle Asia.



Figs. 1–2. *Apocheiridium ferum*, ♂, from Babatag (IZB 230). – 1. Pedipalp, dorsal view; – 2. Tip of the cheliceral movable finger. – Scale line: 0.3 mm.

Figs. 3–6. *Apocheiridium rossicum*. – 3, 4. Pedipalp, dorsal view, ♂♂ from Chon-Uryuktu (IZB 231); – 5, 6. Tip of the cheliceral movable finger, ♀ from Arslanbob (IZB 232) (5), ♂ from Arslanbob (IZB 232) (6). – Scale line: 0.3 mm.

2.2. *Apocheiridium rossicum* Redikorzev 1935 (figs. 3–7)

Apocheiridium nepalense Ćurčić 1980 **n. syn.**

Material: Kirghizia, Yarodar, Arslanbob [20], Fergansky Mt. Ridge, 1400–1500 m, under bark of *Juglans regia*, 8. V. 1990 leg. Dashdamirov, 3 ♂♂, 10 ♀♀, 4 T, 1 D, 1 P (IZB 232), 2 ♂♂, 4 ♀♀ (SMNS 3207). – Kungey-Alatau Mt. Ridge, Chon-Uryukty [25], near Issyk-Kul Lake, 2500–3000 m, under bark of *Picea schrenkiana*, 22. V. 1990 leg. Dashdamirov, 4 ♂♂, 10 ♀♀ (IZB 231), 1 ♂, 4 ♀♀ (SMNS 3208).

Description: Carapace 0.79x (♂) and 0.85x (♀) longer than broad. Tergal chaetotaxy 25-30-28-34-37-39-40-38-37-33-16. Galea bifid (♂) or with 3 distal branches (♀). Pedipalp femur 4.75–5.13x (♂) or 3.5x (♀), tibia 3.63–3.67x (♂) or 3.38x (♀), chela with pedicel 4.23–4.30x (♂) or 3.91 (♀), chela without pedicel 4.00–4.10x (♂) or 3.73x (♀), hand with pedicel 2.08–2.20x (♂) or 2.09x (♀) longer than broad.

Measurements (in mm) of pedipalps, ♂ (♀): femur 0.32–0.41/0.07–0.08 (0.35/0.10), tibia 0.29–0.33/0.08–0.09 (0.27/0.08), chela with pedicel 0.43–0.55/0.10–0.13 (0.43/0.11), length of hand with pedicel 0.22–0.27 (0.23), length of finger 0.21–0.29 (0.21).

Remarks: Although no type material of *Apocheiridium nepalense* has been examined, it is doubtless conspecific with *rossicum*. The measurements and ratios of

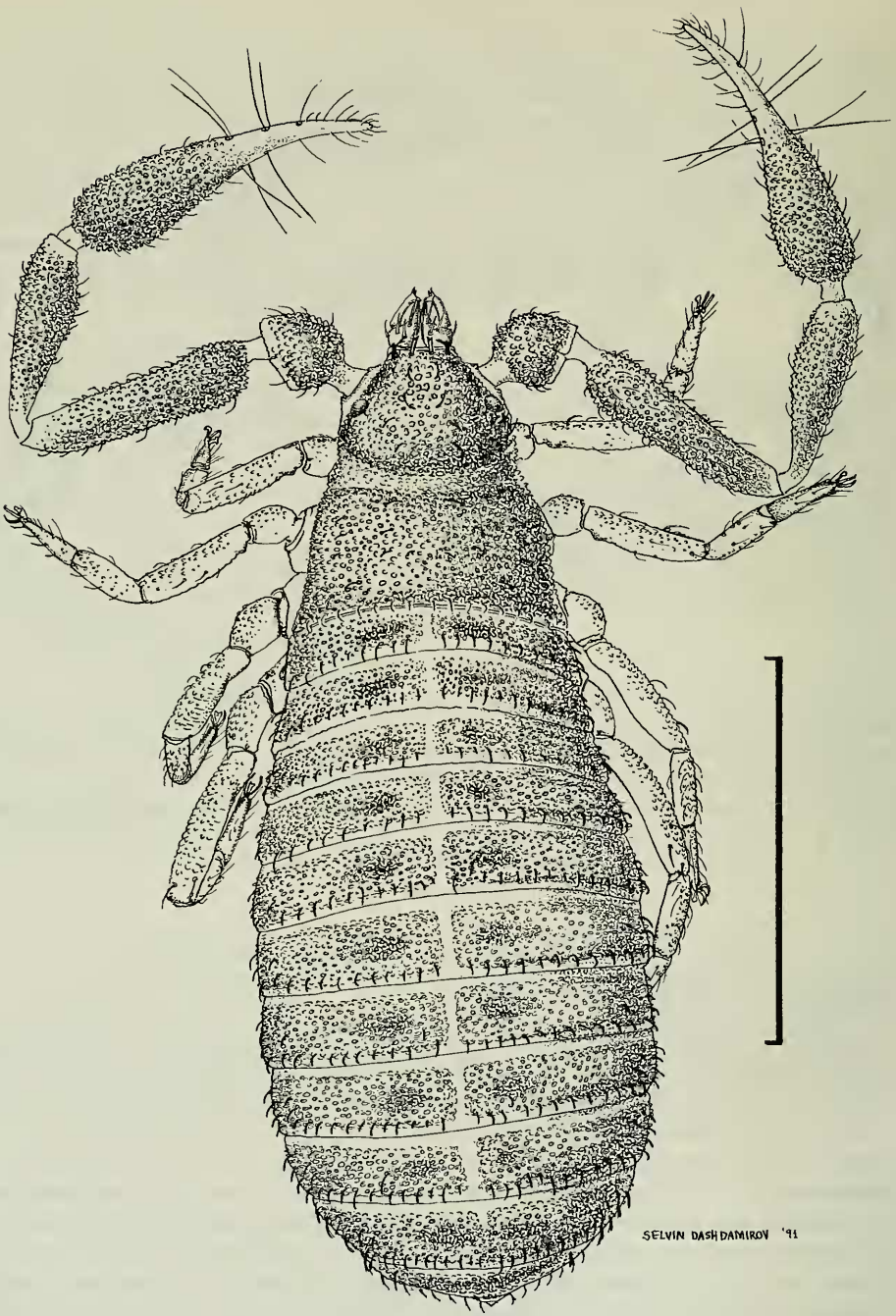


Fig. 7. *Apocheiridium rossicum*, body in dorsal view, ♂ from Arslanbob (IZB 232). – Scale line: 0.5 mm.

the pedipalp segments given by Ćurčić (1980) fully fit in the variation range of *rossicum*, furthermore, newly collected material in the Himalayas by one of us (W. S.) shows no differences with Middle Asian records.

Distribution: This species has a wide Palaearctic distribution from Estonia in the west to the Siberian Far East and reaching southward to the Himalayas.

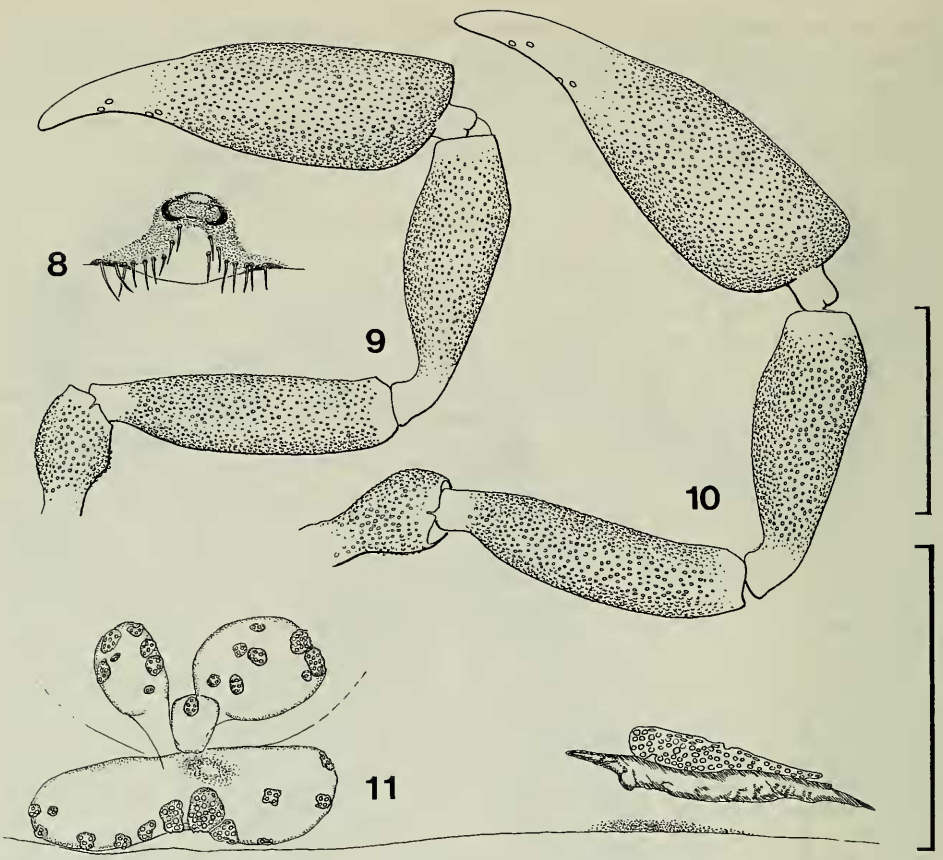
2.3. *Atemnus politus* (Simon 1878)

Material: Turkmenia, Kopetdagh, Firyuza [4], among *Biota* (*Thuya*) plants, 20. IV. 1987 leg. Kalabin, 1 T (IZB 178). – Kopetdagh, Firyuza [4], shelterbelt (Pinetum, *Rubus*), 27. IV. 1987 leg. Kalabin, 1 ♀, 2 D, 1 P (IZB 181). – Kopetdagh, Dushak [5], plateau (Juniperetum), 10. IX. 1987 leg. Kalabin, 1 ♀ (BIN). – Kopetdagh, Dushak [5], forest, 10. V. 1987 leg. Kalabin, 1 ♀ (BIN). – Uzbekistan, Syurdarya Distr., Tashkent [12], 25. XI. 1909 leg. Zarudnyi, holotype ♀ of *turkestanicus* Redikorzev 1922 (ZIP 242). – Djizak Distr., Nuratinsky Reserve [11], Khayatsay, 1200 m, forest of *Juglans, Persica, Salix, Malus, Amygdalus*, in litter, 9. IV. 1990 leg. Dashdamirov, 1 D (IZB 248). – Kirghizia, Tatyur Mt. Ridge [22], 25. VI. 1986 leg. Ovtchinnikov, 1 ♀ (IZB 173). – Talass Mt. Ridge, Itagar [18], 2. VI. 1987 leg. Zonstein, 1 ♂ (IZB 188). – Chuyskaya Valley, Dzhangi-Pakhta [21], under bark of *Ulmus*, 10. VI. 1986 leg. Ovtchinnikov, 1 ♀ (IZB 192), 2 ♂♂, 4 ♀♀ (IZB 200). – Uzun-Akhta-Tau [19], 1700 m, 14. VIII. 1986 leg. Ovtchinnikov, 3 ♂♂, 24 ♀♀ (IZB 194), 1 ♂, 6 ♀♀ (SMNS 3209), 4 ♀♀ (SMF). – Boomskoye Valley, Kankap [24], 3. VII. 1985 leg. Ovtchinnikov, 5 ♀♀ (IZB 201). – Moldo-Too Mt. Ridge [23], Kanzherty, 14. VII. 1987 leg. Zonstein, 1 ♀ (IZB 205). – Kungey-Alatau Mt. Ridge, Chon-Uryukty [25], near Issyk-Kul Lake, 2500–3000 m, under stones, 20. V. 1990 leg. Dashdamirov, 5 ♂♂, 7 ♀♀ (IZB 242), 2 ♂♂, 4 ♀♀ (SMNS 3210). – Fergansky Mt. Ridge, Yarodar, Arslanbob [20], 1400–1500 m, forest of *Juglans, Acer, Malus, Prunus, Crataegus*, 8. V. 1990 leg. Dashdamirov, 1 T under stones (IZB 244), 3 ♂♂, 1 ♀ (IZB 245), 1 ♂, 1 ♀ under bark of *Juglans* (SMNS 3211), 2 ♀♀, 1 T in litter (IZB 261). – Kazakhstan, Djambul Area, Mayunkumsky Distr., 17 km E Khantau [29], 12. VI. 1990 leg. Fedorov & Zyuzin, 2 ♂♂ (IZB 261). – Guriev Area, Onere [2], overgrowth of reed, 16. V. 1989 leg. Tarabaev & Zyuzin, 1 ♂ (IZB 241). – Tadjikistan, Sary-Khosor Reserve, 50 km N Khovaling, Mullo-Kuni [10], 1500 m, under stones, 28. IV. 1990 leg. Dashdamirov, 5 ♂♂, 3 ♀♀ (IZB 243), 3 ♂♂, 2 ♀♀ (SMNS 3212). – Sary-Khosor Reserve, 50 km N Khovaling, Mullo-Kuni [10], 1600 m, under stones, 29. IV. 1990 leg. Aliev, Zonstein & Dashdamirov, 3 ♀♀ (IZB 246).

2.4. *Diplotemnus egregius* Beier 1959 (figs. 8–11)

Material: Tadjikistan, Gandzhina [7], 7.–12. IV. 1987 leg. Zonstein & Zorkin, 1 ♂, 2 ♀♀ (IZB 185). – Gandzhina [7], 800 m, under stones, 19. IV. 1990 leg. Dashdamirov, 1 ♀ (IZB 234).

Description of ♂ from Gandzhina: Pedipalps dark red, carapace slightly red-brown, tergites and legs lighter yellow-brown. Surface of carapace and pedipalps regularly granulate. Carapace 1.26x longer than broad, with 4 setae on anterior margin and 7 setae on posterior margin; two furrows on carapace present, posterior furrow closer to posterior margin than to anterior furrow; 2 eyes present. Chelicera with 5 setae on palm, *b*, *sb* and *es* finely denticulate, movable finger only with 1 simple seta; serrula exterior consisting of 24 lamellae; flagellum consisting of 4 blades, anterior one with several spinules on anterior face, other blades simple. Galea only with 2 tiny terminal branches (about 6 branches in ♀♀). Tergal chaetotaxy 7-8-6-9-10-10-10-10-9-8 (4 tactile ones) -8 (4 tactile ones.). Sternal chaetotaxy x-17-10-10-11-9-8-9-9-9-8 (4 longer ones). Genital opercula as in fig. 8 (spermatheca of ♀ as in fig. 11). Pedipalp trochanter 2.0x, femur 4.03x, tibia 2.96x, chela with pedicel



Figs. 8–11. *Diplotemnus egregius*, from Gandzhina (IZB 185). – 8. Genital area, ♂; – 9. Pedipalp, dorsal view, ♂; – 10. Pedipalp, dorsal view, ♀; – 11. Spermatheca and cribriform plates. – Scale line: 1.0 mm (8–10), 0.17 mm (11).

3.49x and chelal palm with pedicel 2.37x longer than broad. Fixed and movable finger with 31 marginal teeth each. Venom apparatus present in fixed finger, nodus ramosus close to *it*. Leg IV with a single tactile seta medially on tarsus, TS = 0.54.

Measurements (in mm), ♂: body length 4.19, carapace 1.36/1.08, pedipalp trochanter 0.72/0.36, femur 1.45/0.36, tibia 1.45/0.49, chela with pedicel 2.06/0.59, chela length without pedicel 1.97, length of movable finger 0.77, length of chelal palm with pedicel 1.40.

Remarks: This species is characterized by its large size unique within the genus *Diplotemnus*, especially in ♀♀ reaching 7.0 mm. The shape of the female spermatheca seems to be also diagnostic; it consists of 4 terminally expanded sacs with many cribriform plates (fig. 11). Such large spermathecae are the first to be recorded in *Diplotemnus*, however, the genitalia of most congeners have not been described. *Diplotemnus egregius* is closely related to *insolitus* Chamberlin 1933 according to the spermathecal structure (compare figs. 11 & 13), but it can easily be distinguished by the body size.

Distribution: *Diplotemnus egregius* has hitherto been reported only by a single female from Afghanistan (Beier 1959), this being the first record from Middle Asia. All specimens were collected under stones on dry slopes.

2.5. *Diplotemnus insolitus* Chamberlin 1933 (figs. 12–33, 36–37)

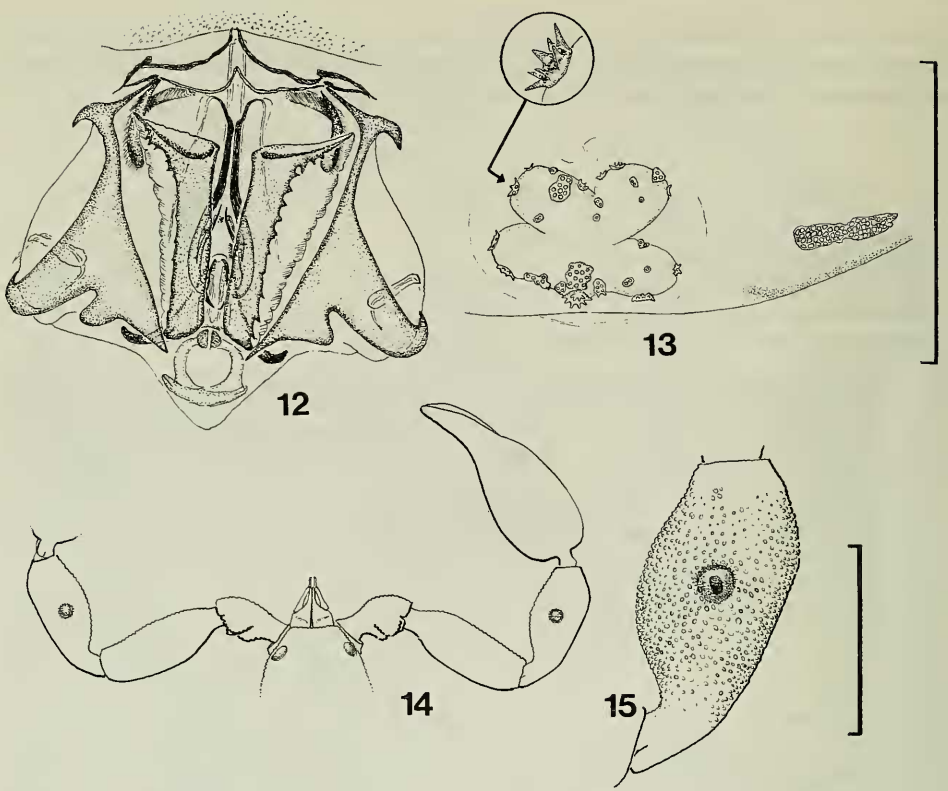
Diplotemnus afghanicus Beier 1959 **n. syn.**
Diplotemnus lindbergi Beier 1960 **n. syn.**
Diplotemnus ophthalmicus Redikorzev 1949 **n. syn.**
Diplotemnus persicus (Redikorzev 1934) **n. comb.** and **n. syn.**
Diplotemnus insolitus sinensis (Schenkel 1953) **n. comb.**

Material: Kazakhstan, Mangyshlak, Ustyurt, Duken [3], 5. V. 1985 leg. Deryugin, 1 ♂ (IZB 189). – Guriev Area, plain 5 km E winter camp Kandybay [1], 17. V. 1989 leg. Zyuzin & Tarabaev, 1 ♀ (IZB 240). – Chimkent Area, Karatau Mts., Boroldaytau Mt. Ridge, Borolday [15], from the shell *Loucozonella*, 15. IV. 1988 leg. Tarabaev, 2 ♂♂, 2 ♀♀ (IZB 167). – Zailiysky Alatau, 30 km E Chimkent, Vannovka [16], 850 m, under stones, 6. IV. 1990 leg. Dashdamirov, 1 ♀ (IZB 233). – Chimkent Area, Suzak Distr., Karatau Mt. Ridge, 25 km WSW Chulak-Kurgan [14], 25. VI. 1989 leg. Fedorov, Komarova, Tarabaev & Zyuzin, 1 ♀ (IZB 239). – Djambul Area, Mayunkumsky Distr., Karabugeg [17], 29. VI. 1980 leg. Fedorov, Komarova, Tarabaev & Zyuzin, 2 ♂♂ (IZB 238), 1 ♂ (SMNS 3213). – Alma-Ata Area, Talgar Distr., Ili River [26], Kanchagaysky, 8. V. 1991 leg. Fedorov, Ibraev & Zyuzin, 1 ♀ (IZB 258). – Djambul Area, Sarysusky Distr., Bek-Pak-Dala Desert [27], 26 km NNE Ulanbel, under *Haloxylon*, 4. X. 1991 leg. Fedorov & Zyuzin, 1 ♀ (IZB 259). – Djambul Area, Mayunkumsky Distr., 17 km E Khantau, Khantau Mts. [28], 9.–11. VI. 1990 leg. Fedorov & Zyuzin, 2 ♂♂, 1 ♀ (IZB 262), 1 ♂ (SMNS 3214). – Djambul Area, Mayunkumsky Distr., 17 km E Khantau, Sunkar Mt. [29], 12. VI. 1990 leg. Fedorov & Zyuzin, 1 ♀ (IZB 260). – Uzbekistan, Tashkent Area, Aksak-Ata [13], 21. VI. 1987 leg. Zorkin, 1 ♀ (IZB 198). – Kirghizia, Chuyskaya Valley, Chon-Aryk [35], 1. III. 1986 leg. Ovtchinnikov, 1 ♂ (IZB 196). – Boomskoye Canyon, Kankap [24], 3. VII. 1985 leg. Ovtchinnikov, 5 ♀♀ (IZB 201). – Tadjikistan, Dangara Distr., Sibeston [9], Kolkot, near Nurek Reservoir, 1450–1550 m, under stones, 2. V. 1990 leg. Dashdamirov, 2 ♂♂ 1 ♀, 2 T (IZB 236), 1 ♂, 1 ♀ (SMNS 3215). – Same locality, 3. V. 1990 leg. Dashdamirov, 1 ♀, 2 T (IZB 235). – Karatau Mt. Ridge [8], Kuibyshevsky, 850–1300 m, under stones, 27. IV. 1990 leg. Dashdamirov, 1 ♂, 3 T (IZB 237).

Material for comparison: Kazakhstan, Chimkent Area, Duany-Tau, 20. V. 1923 leg. Kuznetsov, 1 syntype ♀ of *ophthalmicus* (ZIP 433). – Iran, Kerman, Bapi-Insuf-Sade, 21.–23. III. 1927 leg. Kuznetsov, holotype ♂ of *persicus* (ZIP 854). – Azerbaijan, Ordubad, at roots of *Ephedra*, 12. VIII. 1933 leg. Znoiko, 3 ♂♂ (ZIP 1177). – Turkmenia, Kopetdagh Mts., Pordere, 1200 m, 8.–10. VIII. 1979 leg. Fet, 1 ♂ (ZMMU).

Remarks: The present large series from Middle Asia, coupled with museum material including types from adjacent regions, make it possible to provide some generalizations, which are of significance for the systematics of the genus *Diplotemnus*.

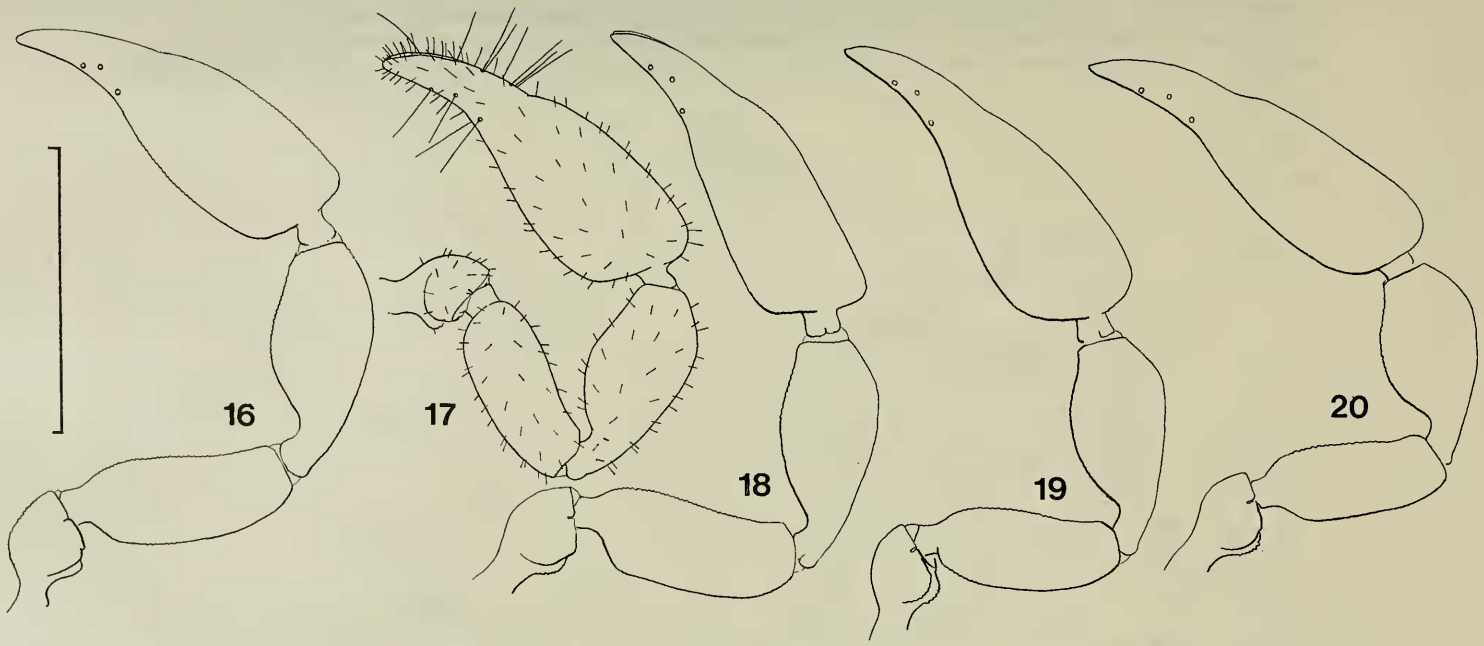
It is necessary to mention that many authors (including ourselves) made a mistake in determining these specimens as *Diplotemnus piger* (Simon 1878) (Beier 1971, Verner 1971, Schawaller & Dashdamirov 1988, Schawaller 1989, Dashdamirov 1991) having overlooked a paper by Vachon (1970) in which he shows that the type of *Chelifer piger* Simon 1878 actually represents *Withius subruber* (Simon 1879). Thus, the valid name is now *Withius piger* (Simon 1878). Vachon (1970) provided a new name, *Diplotemnus beieri* Vachon 1970, for the species that previously has been misidentified as *Diplotemnus piger*.



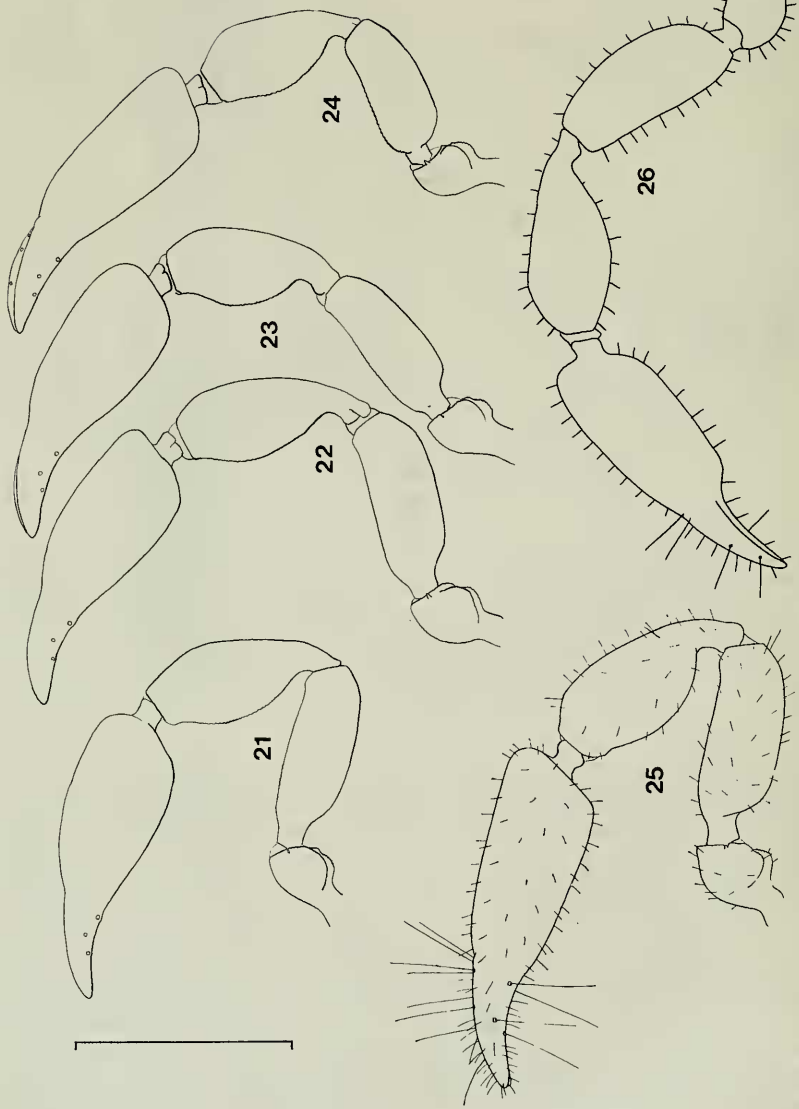
Figs. 12–15. *Diplotemnus insolitus*. – 12. Genitalia, ♂ from Iran, holotype of *persicus* Redikorzev 1934 (ZIP 854); – 13. Spermatheca and cribriform plates, ♀ from Sibeston (IZB 236); – 14. Anterior part of carapace with pedipalps, ♀ from Vannovka (IZB 233); – 15. Pedipalp tibia, dorsal view, ♀ from Vannovka (IZB 233). – Scale line: 0.5 mm (12, 15), 0.17 mm (13).

Schawaller (1985, 1989) has shown that *Diplotemnus milleri* Krumpal 1983, *D. ophthalmicus* Redikorzev 1949, *D. pomerantzevi* Redikorzev 1949 and *D. turanicus* Krumpal 1983 are all synonyms of „*Diplotemnus piger*". Also, Dashdamirov (1991) has shown that *Withius persicus* (Redikorzev 1934) is a synonym of „*Diplotemnus piger*". For that time, *Diplotemnus persicus* (Redikorzev 1934) has become the oldest available name for the species in question.

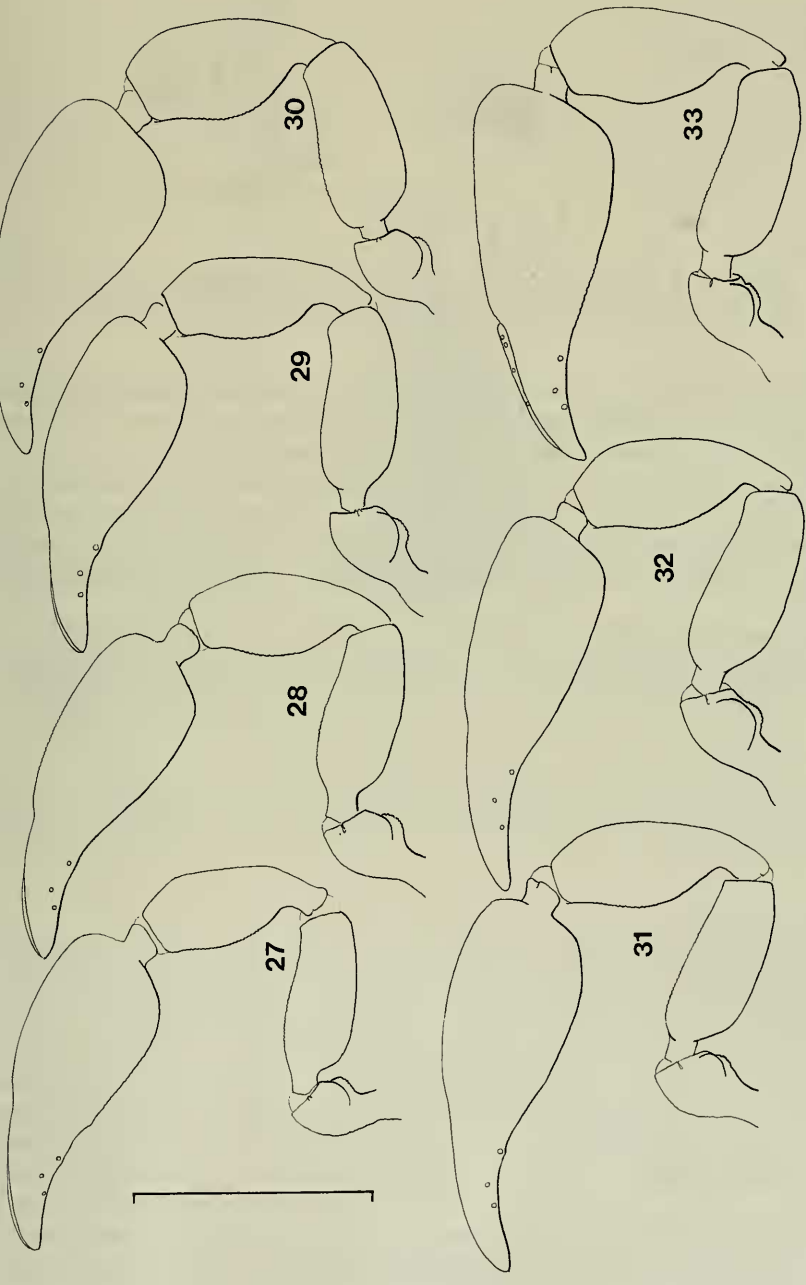
However, after the present materials from Middle Asia have been studied, variability of some morphological structures has become apparent. This concerns mainly the size and proportions of the pedipalps with gradual transitions between the extreme values of these characters (compare figs. 16–33). We also include into this row the original drawings (copied to an approximate scale) of *afghanicus* (Beier 1959: fig. 14), *lindbergi* (Beier 1960: fig. 1) and also *insolitus* (Chamberlin 1933: fig. 1), which also nicely fit in the variation range of the above characters. In other words, we face only one single species involved: *Diplotemnus insolitus* Chamberlin 1933, which was described from the northwestern Himalayas „probably in or near Kabul or Lahore". Earlier, one of us (W. S.) has already supposed that all *Diplotemnus* species from Middle Asia and Afghanistan are probably one single bio-



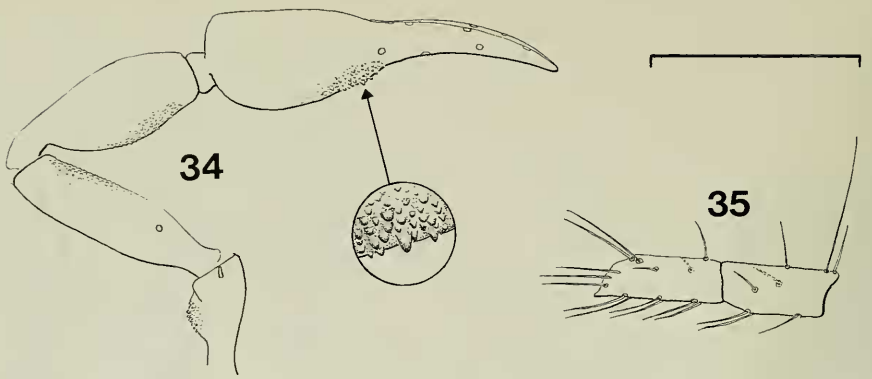
Figs. 16–20. *Diplotemnus insolitus*, ♂♂, pedipalps in dorsal view. – 16. From Karatau (IZB 237); – 17. From Afghanistan, holotype of *lindbergi*, copy from BEIER 1960: fig. 1; – 18. From Karabugeg (IZB 238); – 19. From Kankap (IZB 202); – 20. From Duken (IZB 189). – Scale line: 1.0 mm.



Figs. 21–26. *Diplotemnus insolitus*, ♂♂, pedipalps in dorsal view. – 21. From Sibeston (IZB 236); – 22. From Borolday (IZB 167); – 23. From Chon-Aryk (IZB 196); – 24. From Karabugeg (IZB 238); – 25. From Afghanistan, holotype of *afghanicus*, copy from Beier 1959: fig. 14; – 26. From Western Himalayas, holotype of *insolitus*, reverse copy of Chamberlin 1933: fig. 1. – Scale line: 1.0 mm.



Figs. 27–33. *Diplotemnus insolitus*, ♀♀, pedipalps in dorsal view. – 27. From Sibeston (IZB 235); – 28. From Chulak-Kurgan (IZB 239); – 29. From Vannovka (IZB 233); – 30. From Borolday (IZB 167); – 31. From Sibeston (IZB 236); – 32. From Aksak-Ata (IZB 198); – 33. From Kandybay (IZB 240). – Scale line: 1.0 mm.



Figs. 34–35. *Minniza* sp. ♀ from Dzham (IZB 264). – 34. Pedipalp, dorsal view; – 35. Tarsus IV, lateral view. – Scale line: 0.6 mm (34), 0.3 mm (35).

species (SCHAWALLER 1985). We do not discuss here any subspecific separation, thus we have to establish a **new combination**: *Diplotemnus ophthalmicus sinensis* (Schenkel 1953) = *Diplotemnus insolitus sinensis* (Schenkel 1953).

In the case of *Diplotemnus lindbergi*, BEIER (1960) utilized tergal chaetotaxy to separate this species from other congeners. We have examined abundant material, including some types, and disagree with his conclusion. Tergal chaetotaxy is more variable than he stated, even within the same population (from 3 to 8 setae on each semitergite).

The scattergram (fig. 36) shows the distribution of 52 individuals in relation to the length and width of the pedipalp chela. The ratios of some *insolitus* Chamberlin 1933, *pieperi* Helversen 1965 (from Selvagens Islands) and *vachoni* Dumitresco &

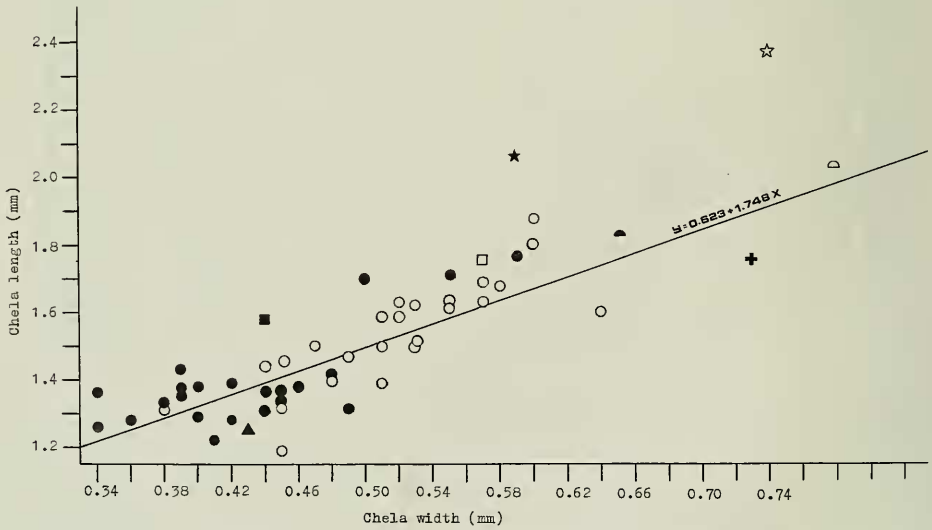


Fig. 36. Ratio of chela length (with pedicel) versus width. – Circle : *insolitus*; – square: *afghanicus*; – triangle: *lindbergi*; – asterisk: *egregius*; – cross: *pieperi*; – semicircle: *vachoni*. – Open symbols (♀♀), full symbols (♂♂).

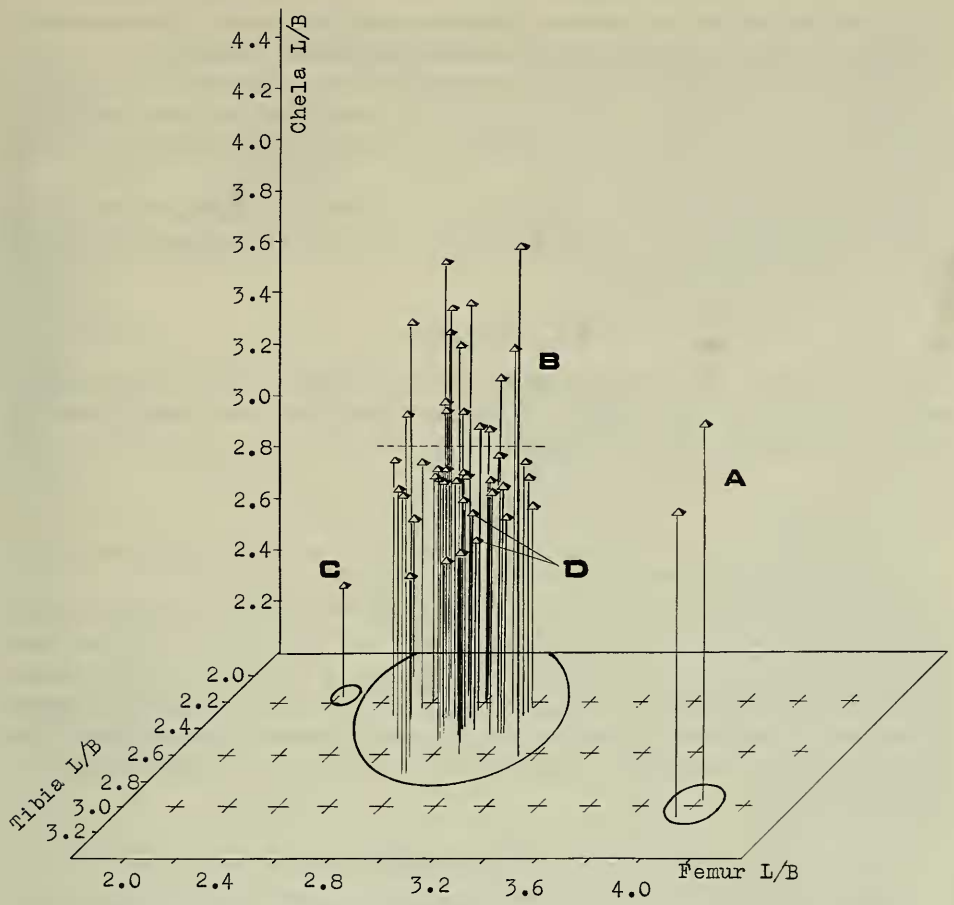


Fig. 37. Ratio according to the proportions of pedipalp femur (X), tibia (Z) and chela (Y). – A. *egregius*; – B. „*insolitus*"-group; – C. *pieperi*; – D. *vachoni*.

Orghidan 1960 (from Romania) are indicated as given in the literature. All ratios (excluding those of *egregius*) are situated near a single line, which points to a single species. The diagram leads to one of two conclusions: either the species *insolitus*, *pieperi* and *vachoni* are morphologically inseparable, or the used characters are no satisfactory for the separation of these forms. Although it is obvious from the following graph (fig. 37) that *pieperi* is nevertheless separate from *insolitus* (the limits of these species are given approximately), it is necessary to mention that the top part of the „*insolitus*"-group (fig. 37: B) is represented mainly by males, while *vachoni* is situated within this group (fig. 37: D).

The separation of these 3 species as given in the literature is based on the following characters: the ratio of femur length/width, tibia length/width and chela length/width; number of blades of the serrula exterior (21–24 in *insolitus*, 24 in *pieperi*, 22–25 in *vachoni*); size and shape of the galea; chaetotaxy of the carapace, especially near the eyes. It thus becomes clear that a separation by these characters is not satisfactory. Eventually we face a transition field between geographical subspecies and

fully established biospecies, where *vachoni* is probably a synonym of *insolitus* whereas *pieperi* is a morphologically somewhat different insular population.

Teratology: A single female from Vannovka (IZB 233) is characterized by its surprising teratology (figs. 14–15). The eye-like protuberance on the dorsal side of the palpal tibia seems to be unique and cannot be compared with similar structures in other pseudoscorpions.

Distribution: The species is widespread in the Palaearctic region, ranging from Algeria in the west to China and the Himalayas in the east. All specimens have been collected under stones.

3. Addendum

Since our former parts on pseudoscorpions from Middle Asia, dealing with the families Chthoniidae, Neobisiidae, Olpiidae and Garypidae, new material came to our disposal which is accumulated herein as an addendum.

3.1. *Minniza* sp. (figs. 34–35)

Material: Uzbekistan, Samarkand Area, Sovetobadsky Distr., Zaravshansky Mt. Ridge, Dzham [31], 8. VI. 1991 leg. Kandykbaev & Zyuzin, 1 ♀ (IZB 264).

Remarks: This single female is very similar to *deserticola* Simon 1885 by its size and the shape of the pedipalpal segments (femur 0.63/0.18 mm, 3.5x longer than broad; tibia 0.58/0.23 mm, 2.52x; chela 1.13/0.30 mm, 3.77x), and to *vermis* Simon 1881 by its tarsal chaetotaxy of the leg IV (fig. 35). This female is distinguished from both *deserticola* and *vermis* by the presence of granulation on the anterior part of the carapace and by granulation turning on the medial side of the chelal hand into tubercles (fig. 34).

3.2. *Bisetocreagris nuratiensis* Dashdamirov & Schawaller 1991

Material: Kazakhstan, Alma-Ata Area (Semiretchie), Kopa River [33], fir forest in litter, 7. X. 1932 leg. Shnitnikov, 3 ♂♂, 2 ♀♀ (ZIP 1151), 1 ♀ (ZIP 1152).

Remarks: This old material was determined by Redikorzev (1949) as *Olpium pallipes* Lucas 1845.

3.3. *Calocheiridius centralis* (Beier 1952)

Material: Uzbekistan, Samarkand Area, Sovetobadsky Distr., Zaravshansky Mt. Ridge, Dzham [31], 8. VI. 1991 leg. Kandykbaev & Zyuzin, 1 ♀ (IZB 265).

3.4. *Olpium* (?)*lindbergi* Beier 1959

Material: Kazakhstan, Djambul Area, Mayunkumsky Distr., road between Mirnyi and Khantau at km 61 [32], 9. VI. 1990 leg. Fedorov & Zyuzin, 1 ♂, 1 ♀ (IZB 266), 1 ♀ (SMNS 3217).

3.5. *Geogarypus continentalis* (Redikorzev 1934)

Material: Kazakhstan, Djambul Area, Krasnogorsky Distr., 15.7 km NW Kenen [30], Chu-Illiyskye Mts., 14. VI. 1990 leg. Fedorov & Zyuzin, 1 ♀ (IZB 263). – Djambul Area, Mayunkumsky Distr., road between Mirnyi and Khantau at km 61 [32], 9. VI. 1990 leg. Fedorov & Zyuzin, 1 ♂, 1 ♀ (IZB 267). – Djambul Area, Sarysusky Distr., 40 km NE Ulanbel, Bek-Pak-Dala Desert, Shengeldy [34], 4. VI. 1990 leg. Fedorov & Zyuzin, 1 ♂, 1 ♀ (IZB 268).

Fig. 38. Collecting localities of pseudoscorpions in Middle Asia; full symbols point to Cheiridiidae and Atemnidae, open symbols to additional material of Neobisiidae, Olpiidae and Garypidae. – *1.* Kandybay (*Diplotemnus insolitus*); – *2.* Onere (*Atemnus politus*); – *3.* Duken (*D. insolitus*); – *4.* Firyuza (*A. politus*); – *5.* Dushak (*A. politus*); – *6.* Babatag (*Apocheiridium ferum*); – *7.* Gandzhina (*Diplotemnus egregius*); – *8.* Karatau (*D. insolitus*); – *9.* Sibeston (*D. insolitus*); – *10.* Mullo-Kuni (*A. politus*); – *11.* Nuratau (*A. politus*); – *12.* Tashkent (*A. politus*); – *13.* Aksak-Ata (*D. insolitus*); – *14.* Chulak-Kurgan (*D. insolitus*); – *15.* Borolday (*D. insolitus*); – *16.* Vannovka (*D. insolitus*); – *17.* Karabugeg (*D. insolitus*); – *18.* Itagar (*A. politus*); – *19.* Uzun-Akhta-Tau (*A. politus*); – *20.* Arslanbob (*Apocheiridium rossicum, A. politus*); – *21.* Dzhangi-Pakhta (*A. politus*); – *22.* Tatyur (*A. politus*); – *23.* Moldo-Too (*A. politus*); – *24.* Kankap (*A. politus*); – *25.* Chon-Uryuktu (*Apocheiridium rossicum, A. politus*); – *26.* Ili (*D. insolitus*); – *27.* Bek-Pak-Dala (*D. insolitus*); – *28.* Khantau (*D. insolitus*); – *29.* Sunkar (*A. politus, D. insolitus*); – *30.* Kenen (*Geogarypus continentalis*); – *31.* Dzham (*Calocheiridius centralis, Minniza* sp.); – *32.* Motor road between Mirnyi-Khantau (*Olpium (?)lindbergi, G. continentalis*); – *33.* Kora (Kopa?) (*Bisetocreagris nuratiensis*); – *34.* Shengeldy (*G. continentalis*); – *35.* Chon-Aryk (*D. insolitus*).

4. References

Beier, M. (1959): Zur Kenntnis der Pseudoscorpioniden Fauna Afghanistans. – Zool. Jb. (Abt. Syst.), **87**: 257–282; Jena.

– (1960): Pseudoscorpionidea. Contribution à l'étude de la faune d'Afghanistan 27. – K. fysiogr. Sällsk. Lund Förh., **31**: 1–4; Lund.

– (1967): Ergebnisse zoologischer Sammelreisen in die Türkei. Pseudoscorpionidea. – Annln naturh. Mus. Wien, **70**: 301–323; Wien.

– (1971): Pseudoscorpione aus dem Iran. – Annln naturh. Mus. Wien, **75**: 357–366; Wien.

Chamberlin, J. C. (1933): Some false scorpions of the subfamily Miratemninae (Arachnida, Chelonethida). – Ann. ent. Soc. Amer., **26**: 262–269; Columbus.

Ćurčić, B. P. M. (1980): Pseudoscorpions from Nepal. – Bull. Mus. Hist. nat., (B) **35**: 77–101; Beograd.

Dashdamirov, S. (1991): Identity of *Withius persicus* (Redikorzev, 1934) (Arachnida: Pseudoscorpiones). – Korean Arachnol., **7**: 101–104; Seoul.

Dumitresco, M. & Orghidan, T. (1969): Sur deux espèces nouvelles de Pseudoscorpions (Arachnides) lithoclasicoles de Roumanie: *Diplotemnus vachoni* (Atemnidae) et *Dactylochelifer marlausicolus*. – Bull. Mus. natn. Hist. nat., Paris (2) **41**: 675–687; Paris.

Helversen, O. (1965): Einige Pseudoskorpione von den Ilhas Selvagens. – Bolm Mus. munic. Funchal, **19**: 95–103; Funchal.

Redikorzev, V. (1934): Neue paläarktische Pseudoskorpione. – Zool. Jb. (Abt. Syst.), **65**: 423–440; Jena.

– (1935): *Apocheiridium rossicum* sp. n. – C. R. Acad. sci. USSR, 1: 184–186; Leningrad.

– (1949): Pseudoscorpionidea of Central Asia. – Trudy zool. Inst. Leningrad, **8**: 638–668; Leningrad.

Schawaller, W. (1985): Pseudoskorpione aus der Sowjetunion (Arachnida: Pseudoscorpiones). – Stuttgarter Beitr. Naturk., (A) **385**: 1–12; Stuttgart.

– (1989): Pseudoskorpione aus der Sowjetunion, Teil 3 (Arachnida: Pseudoscorpiones). – Stuttgarter Beitr. Naturk., (A) **440**: 1–30; Stuttgart.

Schawaller, W. & Dashdamirov, S. (1988): Pseudoskorpione aus dem Kaukasus, Teil 2 (Arachnida). – Stuttgarter Beitr. Naturk., (A) **415**: 1–51; Stuttgart.

Vachon, M. (1970): Remarques sur *Withius piger* (Simon, 1878) nov. comb. (Pseudoscorpion, Cheliferidae) et sur le genre *Diplotemnus* J. C. Chamberlin, 1933, à propos de *Diplotemnus beieri* nov. nom. (Pseudoscorpion, Miratemnidae). – Bull. Mus. natn. Hist. nat., Paris (2) **42**: 185–191; Paris.

Verner, P. H. (1971): Stirci – Pseudoscorpionidea. – Klič Zvířeny ČSSR, 4: 19–31; Praha.

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